AMENDMENTS TO THE CLAIMS

1-19 (Canceled)

20 (Currently Amended) A plasma etching method of performing plasma etching to an object made of silicon in a treatment chamber, said plasma etching method comprising:

introducing, into the treatment chamber, an etching gas which includes a fluorine compound gas and a rare gas;

energizing the etching gas into a plasma state by supplying electricity to the etching gas, the electricity having a frequency that is equal to or more than 27 MHz; and

etching the object using the plasma.

21 (Original) The plasma etching method according to Claim 20,

wherein the etching gas further includes one of oxygen (O_2) gas, carbon monoxide (CO) gas, and carbon dioxide (CO_2) gas, and

the fluorine compound gas is sulfur hexafluoride (SF_6) gas.

22 (Original) The plasma etching method according to Claim 21,

wherein the rare gas is helium (He) gas.

23 (Original) The plasma etching method according to Claim 22,

wherein a volume of the helium (He) gas introduced into the treatment chamber is equal to or more than 30% of a total flow rate of the etching gas.

24 (Original) The plasma etching method according to Claim 23,

wherein an inside wall of the treatment chamber is made of an insulating material.

25 (Original) The plasma etching method according to Claim 24,

wherein the insulating material is one of quartz, alumina, an aluminum matrix with alumite treatment, yttrium oxide, silicon carbide, and aluminum nitride.

26 **(Original)** The plasma etching method according to Claim 21,

wherein the etching gas further includes chlorine (Cl_2) gas.

27 (Original) The plasma etching method according to Claim 26,

wherein a volume of the chlorine (Cl_2) gas introduced into the treatment chamber is equal to or less than 10% of a total flow rate of the etching gas.

28 (Original) The plasma etching method according to Claim 20,

wherein the fluorine compound gas is one of sulfur hexafluoride (SF_6) gas and nitrogen trifluoride (NF_3) gas.

29 (Original) The plasma etching method according to Claim 28,

wherein the rare gas is helium (He) gas, and

a volume of the helium (He) gas introduced into the treatment chamber is equal to or more than 80% of a total flow rate of the etching gas.

30 (Original) The plasma etching method according to Claim 20,

wherein the etching gas further includes polymer forming gas, and

the fluorine compound is sulfur hexafluoride (SF_6) gas.

31 (Original) The plasma etching method according to Claim 30,

wherein the polymer forming gas is one of octafluorocyclobutane (C_4F_8) gas, trifluoromethane (CHF_3) gas, octafluorocyclopentene (C_5F_8) gas, and hexafluorobutadiene (C_4F_6) gas.

32 (Currently Amended) The plasma etching method according to Claim 20,

wherein the etching gas further includes one of oxygen (O_2) gas, carbon monoxide (CO) gas, and carbon dioxide (CO_2) gas,

the fluorine compound gas is sulfur hexafluoride (SF_6) gas,

the etching gas comprises a first etching gas, and

etching the object using the plasma comprises a first etching,

the method further comprising:

a second etching of the object after the first etching using a second etching gas which includes a polymer forming gas and sulfur hexafluoride (SF_6) gas as a fluorine compound gas.

~~etching the object by using etching gas which includes one of oxygen (O_2) gas, carbon monoxide (CO) gas, and carbon dioxide (CO_2) gas, and uses sulfur hexafluoride (SF_6) gas as the fluorine compound gas; and then further etching the object by using etching gas which includes polymer forming gas and uses sulfur hexafluoride (SF_6) gas as the fluorine compound gas.~~

33 (Currently Amended) The plasma etching method according to Claim 20,

wherein the etching gas is energized into a plasma state by an inductively coupled plasma (ICP) method.

34 (Original) A device which etches a silicon substrate,

said device forming a trench in the silicon substrate using the plasma etching method according to Claim 20.

35 (Currently Amended) A plasma etching method of performing plasma etching to an object made of silicon in a treatment chamber, said plasma etching method comprising:

introducing, into the treatment chamber, an etching gas which includes a fluorine compound gas and a rare gas; and

etching the object by energizing the etching gas into a plasma state,

wherein the fluorine compound gas is tetrafluoroethane (CF_4) gas, and

an accuracy of an etching depth is increased by lowering an etching rate more, as compared to when gas except tetrafluoroethane (CF_4) gas is used as the fluorine compound gas.

36 (Original) The plasma etching method according to Claim 35,

wherein the rare gas is Ar gas.

37 (Original) The plasma etching method according to Claim 36,

wherein a volume of the Ar gas introduced into the treatment chamber is 50% to 90% of a total flow rate of the etching gas.